REMARKS

The above Amendments and these Remarks are in reply to the Office Action mailed July 6, 2007.

Claims 1-11 were pending in the Application prior to the outstanding Office Action. Claims 1-11 are being amended. No claims are presently being canceled or added. Claims 1-11 remain for the Examiner's consideration.

Based on the following Remarks, reconsideration and withdrawal of the rejections are respectfully requested.

I. Request for Consideration of Previously Submitted IDS

On June 9, 2004, Applicants submitted a 4 page IDS, which included 2 pages of Form PTO-1449. The first page of Form PTO-1449 listed 16 U.S. Patents, 2 U.S. Publications, one Japanese patent, and 1 "Other Documents", the second page of the Form PTO-1449 listed 8 "Other Documents"". This IDS is within the Image File Wrapper on PAIR, shown as having a Mail Room Date of June 14, 2004.

Applicants have received back only the second page of the Form PTO-1449, initialed by the Examiner, indicating the Examiner's consideration of the reference listed thereon.

Applicants respectfully request that the Examiner consider the references listed on the first page of Form PTO-1449 (if the Examiner has not done so already), which as mentioned above, lists 16 U.S. Patents, 2 U.S. Publications, one Japanese patent, and 1 "Other Documents". **Applicants also request that the Examiner initial each reference listed on the Form PTO-1449, and return the initial Form with the next USPTO communication, so that it is clear that the Examiner has considered all the references Applicants citied to the USPTO.** The Examiner is invited to call Applicants undersigned representative if the Examiner has any questions regarding this matter.

II. Summary Of Claim Rejections Under 35 U.S.C. § 103

Claims 1-11 were again rejected under 35 U.S.C. §103(a) as allegedly being unpatentable over Kelly et al. (US Publication No. 2002/0114244), referred to hereafter as "Kelly".

III. Summary of Telephone Conference with Examiner

On July 16, 2007, Applicants' undersigned representative, Jeffrey Kurin, had a brief telephone conference with Examiner Alunkal. During this telephone conference, the Examiner confirmed that the claims would distinguish over the prior art of record, if Applicants amended the claims to make sure all of the features being argued where in the body of the claims, instead of the preamble. Applicants' representative agreed to make such amendments. Applicants thank the Examiner for taking the time to participate in this telephone conference.

IV. Summary of Previous Arguments and Examiner's Response to Arguments

With regards to exemplary claim 1, in the Reply filed on April 17, 2007 (in response to the Office Action of April 10, 2007), Applicants argued that Kelly did not teach a laser driver integrated circuit (LDIC), i.e., a chip, that includes an automatic power controller (APC), a running optical power controller (ROPC), and a write strategy generator (WSG), as required by claim 1. Additionally, Applicants argued that Kelly did not teach that an APC and ROPC, in the same chip, each include their own dedicated offset, gain and sample and hold circuitry. Applicants also argued that the laser diode driver 302 of Kelly, which is analogous to the claimed LDIC, is not configured to be located on an optical pick-up unit (OPU) with a laser diode that is being driven.

In response to the above Arguments, it was asserted in the Office Action (mailed July 6, 2007) that Applicants' had argued features of the invention recited in the preamble, which are not given patentable weight. Applicants believe that the claims were drafted in such a manner that all of the features discussed in their previous arguments should have been given patentable weight. Nevertheless, to expedite prosecution of this application, Applicants have amended the claims to make sure all features discussed in their arguments are included in the body of the claim.

V. Discussion Of Claims

Claim 1, as amended, is reproduced below for the convenience of the Examiner.

1. A laser driver integrated circuit (LDIC), the LDIC including:
an automatic power controller (APC);
a running optical power controller (ROPC); and
a write strategy generator (WSG);
wherein said APC, said ROPC and said WSG are all included in the LDIC;
wherein the LDIC is configured to be located on an optical pickup unit (OPU) and to drive a laser diode that is located on the OPU with the LDIC;
wherein said APC is configured to control an output of the laser diode to compensate for changes in characteristics of the laser diode;
wherein said ROPC is configured to control the output of the laser diode to compensate for variations in an optical media;
wherein said WSG is configured to implement write strategies; and
wherein said APC and said ROPC each include there own dedicated offset, gain and sample and hold circuitry, thereby reducing an amount of analog signals to be sent over a flex cable between the OPU and a main board.

There are numerous reasons why Kelly (US2002/0114244 A1) does not render claim 1 obvious.

First - The laser driver integrate circuit (LDIC) of claim 1 is analogous to the "laser diode driver 302" of Kelly, as conceded by the Examiner. The laser diode driver 302 of Kelly clearly does not include an automatic power controller (APC), a running optical power controller (ROPC), and a write strategy generator (WSG), as required by claim 1.

Second - An integrated circuit (IC), which is also known as a "chip", is an entire electronic circuit built onto a single piece of a solid substrate and enclosed in a small package that is equipped with leads (for example, pins) needed to electrically integrate the IC with a larger electronic system. For example, see the following semiconductor glossary for a definition:
http://semiconductorglossary.com/default.asp?searchterm=integrated+circuit%2C+IC.
Accordingly, claim 1 requires that the APC, ROPC and WSG are all in the same chip. Claim 1 also requires that the APC and ROPC of that chip include their own dedicated

offset, gain and sample and hold circuitry. Such circuitry is typically on a main board that communicates with the OPU via a flex cable. The claimed APC and ROPC each include there own dedicated offset, gain and sample and hold circuitry, thereby reducing an amount of analog signals to be sent over a flex cable between the OPU and a main board.

Paragraph [0070] of Kelly merely states that its automatic power control circuitry 260 can be **on the same circuit board** as the disk controller 50, and that the disk controller includes an EFM modulation encoder 142 with a write strategy circuit 232. Stating that a plurality of components are "on the same circuit board" is completely different than saying that the plurality of components are within the same chip (i.e., within the same integrated circuit (IC)). Rather, stating that a plurality of components are on the same circuit board clearly implies that each of the components are in a separate chip, with all of the separate chips connected to the same circuit board.

Third - The laser driver integrated circuit (LDIC) of claim 1 is "configured to be located on an optical pickup unit (OPU) and to drive a laser diode that is located on the OPU with the LDIC;". Accordingly, it is clear that the LDIC of claim 1 is to be located on an optical pick-up unit (OPU) with the laser diode that the LDIC is driving. The LDIC on the OPU communicates with a main board by sending analog signals over a flex cable. The LDIC of claim 1 is specifically designed for "reducing an amount of analog signals to be sent over a flex cable between the OPU and a main board." In order to do this, the LDIC of claim 1 includes an automatic power controller (APC), a running optical power controller (ROPC), and a write strategy generator (WSG), and the APC and the ROPC each include there own dedicated offset, gain and sample and hold circuitry.

It appears that the "head assembly 68" of Kelly (see FIGS. 2 and 3 of Kelly) is analogous to the "optical pick-up unit (OPU)" of claim 1. Exemplary patent 6,826,138 shows that the terms "optical pickup unit" and "head assembly" are sometimes used interchangeably (see column 5, lines 11-12 of the '138 patent). However, the "head assembly 68" of Kelly clearly does not include an APC, ROPC and WSG, as required by

claim 1. In fact, Kelly doesn't even teach or suggest (or mention for that matter) that its laser diode driver 302 is to be located on the "head assembly 68" with its laser diode 70.

Further, as evidenced by exemplary patent 7,188,348 (see FIG. 2 of the '348, and its description), a laser diode driver need not be located on an optical pickup unit/head assembly, but rather, as in the '348 patent, and likely as is the case in Kelly, a laser diode driver can be located within a disk controller (which is clearly not on an optical pickup unit/head assembly), with the disk controller being on the main board. As explained above, the LDIC of claim 1 is configured to be located on an optical pickup unit with the laser diode that the LDIC is driving. Again, Kelly does not teach or suggest this.

For at least the reasons set forth above, it is asserted that Kelly does not render claim 1 unpatentable. Accordingly, it is respectfully requested that the 103(a) rejection of claim 1 be withdrawn.

Claim 2 requires that "said APC is adapted to receive power control signals over the flex cable that connects the OPU with a controller on the main board, and wherein the LDIC determines a current for which to drive the laser diode, based at least in part on the power control signal."

As explained in paragraph [0019] of the patent application, "Conventional controllers that are located on a main board send current control signals to a laser driver located on an optical pickup. In accordance with an embodiment of the present invention, the controller 108 sends power control signals (rather than current control signals) up the flex 104 to the laser driver 112. This is possible, in part, due to the APC 120 and the ROPC 122 being located within the LDIC 112. When the LDIC 112 receives the power control signals, the APC and ROPC allow the LDIC 112 to determine for itself the required current to drive the laser diodes 130 or 132."

It was asserted in the Office Action that Kelly discloses that the automatic power control circuit 260 and EFM encoder 142 are implemented on the same circuit board to form the LDIC. However, as explained above in the discussion of claim 1, the disclosure in Kelly that a plurality of components are "on the same circuit board" is completely

different than saying that the plurality of components are within the same integrated circuit chip (that is, within the same "laser driver integrated circuit (LDIC)").

Further, claim 2 required that the APC within the LDIC "determines a current for which to drive the laser diode, based at least in part on the power control signal", where the power control signal "is received over the flex cable that connects the OPU with a controller on the main board". As explained above, an APC typically receives a current control signal from a controller. In contrast, claim 2 states that the APC receives a power control signal, and APC itself determines the current for which to drive the laser diode, based at least in part on the power control signal. There is no disclosure of this in Kelly. **This argument was not addressed in the Examiner's Response to Arguments in the Office Action mailed July 6, 2007, even though this argument should have been addressed**. Applicants respectfully request that their arguments regarding claim 2 be addressed, if claim 2 is rejected again.

Further, just because the automatic power control circuit 260 and EFM encoder 142 of Kelly can be on the same circuit board does not mean that the automatic power control circuit 260 of Kelly does what is required by claim 2.

Claim 3 is patentable for at least the reason that it depends from claim 2, which depends from claim 1, as well as for the features that it adds.

Claim 4, as amended, is reproduced below for the convenience of the Examiner.

4. A chip-set, comprising:

a laser driver integrated circuit (LDIC) adapted to drive a laser diode, said LDIC including an automatic power controller (APC) and a running optical power controller (ROPC); and

a power monitor integrated circuit (PMIC) to monitor the laser diode, said PMIC including its own dedicated offset, gain and sample-and-hold circuitry; and

a photo-detector integrated circuit (PDIC) to detect light produced by the laser diode after the light has been reflected from an optical media, said PDIC including its own dedicated offset, gain and sample-and-hold circuitry;

wherein the chip set is configured to be located on an optical pick-up unit (OPU) that can communicate with components on a main board over a flex cable.

There are numerous reasons why Kelly does not render claim 4 unpatentable.

First – Claim 4 is directed to a chip-set configured to be located on an optical pick-up unit (OPU) that can communicate with components on a main board over a flex cable. The claimed chip-set includes a laser driver integrated circuit (LDIC), a power monitor integrated circuit (PMIC) and a photo-detector integrated circuit (PDIC). In other words, claim 4 is directed to a chip-set that includes a laser driver chip, a power monitor chip, and a photo-detector chip. Claim 4 also requires that the laser driver chip (the LDIC) includes both an automatic power controller (APC) and a running optical power controller (ROPC). Kelly does not disclose that a chip-set to be located on an optical pick-up unit (OPU) includes an LDIC, PMIC and PDIC, as is required by claim 4. It is clear that the components of Kelly that are alleged to teach the components required by claim 4 are not all configured to be located on an optical pick-up unit. Rather, such components of Kelly are configured to be located on a main board.

Second – For similar reasons to those discussed above with in the discussion of claim 1, Kelly clearly does not teach that a laser driver **integrated circuit** (LDIC) includes an automatic power controller (APC) and a running optical power controller (ROPC), which is required by claim 4. Rather, as explained above, and conceded by the Examiner, the "laser diode driver 302" of Kelly is analogous to an LDIC. The "laser diode driver 302" of Kelly clearly does not include an APC and a ROPC.

Claim 5 requires that LDIC (of the chip-set of claim 4) further comprises a write strategy generator (WSG) to implement write strategies. The "write strategy circuit 232" of Kelly is clearly not part of a LDIC that also includes an APC and a ROPC, as is required by claim 5.

As explained above in the discussion of claim 1, and conceded by the Examiner, the claimed laser driver integrate circuit (LDIC) is analogous to the "laser diode driver 302" of Kelly. However, the laser diode driver 302 of Kelly clearly does not include a write strategy generator (WSG), as required by claim 5. Rather, the write strategy circuit 232 of Kelly is clearly part of the EFM encoder 142 of Kelly (see FIGS. 7 & 8 of Kelly), which is clearly separate from the "laser diode driver 302" of Kelly.

Since the write strategy generator of claim 5 is part of the LDIC, and the LDIC is to be located on an optical pick-up unit (OPU), the write strategy generator of claim 5 is also to be located on an OPU. As explained above, the head assembly 68 of Kelly appears to be analogous to the claimed OPU. However, the "write strategy circuit 232" of Kelly is clearly not located on the "head assembly 68" of Kelly.

Claim 6 is patentable for at least the reason that it depends from claim 5, which depends from claim 4, as well as for the features that it adds.

Claim 7 is patentable for at least the reason that it depends from claim 4, as well as for the features that it adds.

Claim 8 is patentable for at least the reason that it depends from claim 4, as well as for the features that it adds.

Claim 9 is patentable for at least the reason that it depends from claim 8, which depends from claim 4, as well as for similar reasons discussed above in the discussion of claim 2.

Claim 10 is patentable for at least the reason that it depends from claim 9, which depends from claim 8, which depends from claim 4, as well as for the features that it adds.

Claim 11 is similar to claim 1, but does not require that the LDIC include a write strategy generator (WSG). Nevertheless, it is believed that claim 11 is patentable over

Kelly for many of the same reasons discussed above in the discussion of claim 1, which are discussed below.

First – As conceded by the Examiner, the laser driver integrate circuit (LDIC) of claim 11 is analogous to the "laser diode driver 302" of Kelly. The laser diode driver 302 of Kelly clearly does not include an automatic power controller (APC) and a running optical power controller (ROPC), as required by claim 11.

Second - Claim 11 requires that the APC and ROPC are both in the same chip. Claim 11 also requires that the APC and ROPC of that chip include their own dedicated offset, gain and sample and hold circuitry. Such circuitry is typically on a main board that communicates with the OPU via a flex cable. The claimed APC and ROPC each include there own dedicated offset, gain and sample and hold circuitry, thereby reducing an amount of analog signals to be sent over a flex cable between the OPU and a main board.

As explained above in the discussion of claim 1, Kelly only states that its automatic power control circuitry 260 can be **on the same circuit board** as the disk controller 50, and that the disk controller includes an EFM modulation encoder 142 with a write strategy circuit 232. Stating that a plurality of components are "on the same circuit board" is completely different than saying that the plurality of components are within the same chip (i.e., within the same integrated circuit (IC)). Rather, stating that a plurality of components are on the same circuit board clearly implies that each of the components are in a separate chip, with all of the separate chips connected to the same circuit board.

Third - The laser driver integrated circuit (LDIC) of claim 11 is "configured to be located on an optical pickup unit (OPU) and to drive a laser diode that is located on the OPU with the LDIC;". Accordingly, it is clear that the LDIC of claim 11 is to be located on an optical pick-up unit (OPU) with the laser diode that the LDIC is driving. For similar reasons to those discussed above with reference to claim 1, Kelly does not teach or suggest this.

For at least the reasons set forth above, it is asserted that Kelly does not render claim 11 unpatentable. Accordingly, it is respectfully requested that the 103(a) rejection of claim 11 be withdrawn.

VI. CONCLUSION

In light of the above, it is respectfully requested that all outstanding rejections be reconsidered and withdrawn. The Examiner is respectfully requested to telephone the undersigned if he can assist in any way in expediting issuance of a patent.

The Commissioner is authorized to charge the required fee and any underpayment of fees or credit any overpayment to Deposit Account No. 06-1325 for any matter in connection with this reply, including any fee for extension of time, which may be required.

Respectfully submitted,

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